

# Work Order ID 144498

**\*144498\***

Page 1

Tuesday, April 19, 2016 11:10:04 AM

Item ID: D6102-013 Accept **\*N900040100\*** Setup Start **\*NS1\***  
 Revision ID: Stop **\*NS2\***  
 Item Name: Saddle Billet  
 Start Date: 4/22/2016 Start Qty: 20.00 **\*20\*** Cust Item ID:  
 Required Date: 5/5/2016 Req'd Qty: 20.00 **\*20\*** Customer:  
 Reference:

Approvals: Process Plan: MCS Date: APR 19 2016 Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

| Draw Nbr | Revision Nbr |
|----------|--------------|
| D6102    | Rev D        |

|              |                                                                                                                                                                                                                                                          |      |  |  |  |    |             |                   |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--|--|--|----|-------------|-------------------|
| 100          | PURCHASING                                                                                                                                                                                                                                               | 0.00 |  |  |  | 20 | APR 21 2016 | DAS<br>13<br>9-89 |
| <b>*100*</b> |                                                                                                                                                                                                                                                          |      |  |  |  |    |             |                   |
| Purchasing   | Memo                                                                                                                                                                                                                                                     | 0.00 |  |  |  |    |             |                   |
| Purchasing   | Issue P/O: <u>32122</u> a) Description: Aluminum Billetb) 7.000" x 6.500" x 2.000" thickc) Tolerance on all dimensions is +0.06/0.00d) Grain direction along 6.500" lengthe) Material: 6061-T6/T6511 (QQ-A-250/11 or QQ-A-200/8)Material release certifi |      |  |  |  |    |             |                   |

|              |                                            |      |  |  |  |  |  |  |
|--------------|--------------------------------------------|------|--|--|--|--|--|--|
| 110          | Receive & Inspect for Damage & Mat'l Certs | 0.00 |  |  |  |  |  |  |
| <b>*110*</b> |                                            |      |  |  |  |  |  |  |
| Packaging    | Memo                                       | 0.40 |  |  |  |  |  |  |
| Packaging    | Ensure material certification is attached  |      |  |  |  |  |  |  |

|                 |                                                 |      |  |  |  |    |  |                   |
|-----------------|-------------------------------------------------|------|--|--|--|----|--|-------------------|
| 120             | QC6- Inspect dimensions to drawing              | 0.00 |  |  |  | 20 |  | DAS<br>14<br>9-89 |
| <b>*120*</b>    |                                                 |      |  |  |  |    |  |                   |
| QC              | Memo                                            | 0.00 |  |  |  |    |  |                   |
| Quality Control | Check certification to Dwg D6102 for compliance |      |  |  |  |    |  |                   |

16/05/14

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

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| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div> |  |  |                       |                                              |  |
| Date :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  | Step #:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  | MRB (QSI042) Approval |                                              |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |                       | Completed By                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |                       | Lead hand / Supervisor Approval Verification |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |                       |                                              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |                       |                                              |  |
| <b>Root Cause</b><br><div style="display: flex; justify-content: space-between;"> <div>             Environment <input type="checkbox"/><br/>             Design <input type="checkbox"/><br/>             Doc/Data <input type="checkbox"/><br/>             Equip/Tooling <input type="checkbox"/><br/>             Handling/Pre <input type="checkbox"/><br/>             Material <input type="checkbox"/><br/>             Internal Transport <input type="checkbox"/><br/>             Tribal Knowledge <input type="checkbox"/><br/>             LOA <input type="checkbox"/><br/>             Substation <input type="checkbox"/><br/>             Past Expiry Date <input type="checkbox"/><br/>             Misidentified <input type="checkbox"/> </div> <div>             No Re-verification <input type="checkbox"/><br/>             Operator <input type="checkbox"/><br/>             Offset/Setup <input type="checkbox"/><br/>             Supplier <input type="checkbox"/><br/>             Training <input type="checkbox"/><br/>             Use for Testing <input type="checkbox"/><br/>             Poor Information <input type="checkbox"/><br/>             Rushing <input type="checkbox"/><br/>             Product Improvement <input type="checkbox"/><br/>             Process Improvement <input type="checkbox"/><br/>             Manufacturing Process <input type="checkbox"/><br/>             Past Due <input type="checkbox"/> </div> </div> |  | <b>FAULT CATEGORY</b><br><div style="display: flex; justify-content: space-between;"> <div>             Pressure/Forced <input type="checkbox"/><br/>             Bending <input type="checkbox"/><br/>             Centre Not Concentric <input type="checkbox"/><br/>             Cracks <input type="checkbox"/><br/>             Crimp/Kink/Ripple/Wave <input type="checkbox"/><br/>             Cuffs <input type="checkbox"/><br/>             Crushing <input type="checkbox"/><br/>             Heat Treat <input type="checkbox"/><br/>             Wave/Twist in Tube <input type="checkbox"/><br/>             Marks/Chatter <input type="checkbox"/> </div> <div>             Temperature/Cure <input type="checkbox"/><br/>             Set-up <input type="checkbox"/><br/>             BOM/Route <input type="checkbox"/><br/>             Broken/Damage/Defect <input type="checkbox"/><br/>             Inspection Incomplete/Unqualified <input type="checkbox"/><br/>             Contamination <input type="checkbox"/><br/>             Countersink <input type="checkbox"/><br/>             Cut Too Short <input type="checkbox"/><br/>             Instructions Incomplete/Unclear <input type="checkbox"/><br/>             Drill Holes <input type="checkbox"/> </div> <div>             Power Loss/Surge <input type="checkbox"/><br/>             Folio/Program <input type="checkbox"/><br/>             Grain <input type="checkbox"/><br/>             Weld <input type="checkbox"/><br/>             Wrong Stock Pulled <input type="checkbox"/><br/>             Out of Sequence <input type="checkbox"/><br/>             Off-set <input type="checkbox"/><br/>             Mislabeled <input type="checkbox"/><br/>             Fit/Function <input type="checkbox"/><br/>             Misaligned/off center <input type="checkbox"/> </div> <div>             Positioned Wrong <input type="checkbox"/><br/>             Outside Dimensions <input type="checkbox"/><br/>             Over/Under tolerance <input type="checkbox"/><br/>             Part Incorrect <input type="checkbox"/><br/>             Part Lost/Missing <input type="checkbox"/><br/>             Part Moved <input type="checkbox"/><br/>             Drawing <input type="checkbox"/><br/>             Finish <input type="checkbox"/><br/>             Misread <input type="checkbox"/><br/>             Turning Sequence <input type="checkbox"/> </div> </div> |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |                       |                                              |  |
| OTHER : <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |                       |                                              |  |

Work Order ID 144498

\*144498\*

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Tuesday, April 19, 2016 11:10:04 AM

Item ID: D6102-013 Accept \*N900040100\* Setup Start \*NS1\*  
 Revision ID: Stop \*NS2\*  
 Item Name: Saddle Billet  
 Start Date: 4/22/2016 Start Qty: 20.00 \*20\* Cust Item ID:  
 Required Date: 5/5/2016 Req'd Qty: 20.00 \*20\* Customer:  
 Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start \*NR1\*  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop \*NR2\*

| Sequence ID/<br>Work Center ID | Operation<br>Description                            | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp         |
|--------------------------------|-----------------------------------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|------------------------|
| 130                            | Identify as per dwg & Stock Location: <i>MAT046</i> | 0.00                 |         |        |              |               |               |                  |                        |
| <b>*130*</b>                   |                                                     |                      |         |        |              | <i>20</i>     | <i>0</i>      |                  | DAS<br>14<br>9-30      |
| Packaging                      | Memo                                                | 0.20                 |         |        |              |               |               |                  |                        |
| Packaging                      | LOCATION: MAT046                                    |                      |         |        |              |               |               |                  | <i>16/05/14</i>        |
| 140                            | QC21- Final Inspection - Work Order Release         | 0.00                 |         |        |              |               |               |                  |                        |
| <b>*140*</b>                   |                                                     |                      |         |        |              |               |               |                  |                        |
| QC                             | Memo                                                | 2.00                 |         |        |              |               |               |                  | <i>MCS</i> MAY 17 2016 |
| Quality Control                |                                                     |                      |         |        |              |               |               |                  |                        |

*MCS* MAY 16 2016

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Thermoforming <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/><br/>           Composite <input type="checkbox"/> </div> <div>           Water Jet <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/><br/>           Supplier <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Quality <input type="checkbox"/><br/>           Other <input type="checkbox"/> </div> </div> |  |  |  |                                                                                                                                                     |  |
| Date :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | Step #:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  | MRB (QSI042) Approval<br><br><br>Completed By<br><br><br>Lead hand / Supervisor<br>Approval Verification<br><br><br>QC / QA Coordinator<br>Approval |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |                                                                                                                                                     |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |                                                                                                                                                     |  |
| <b>Root Cause</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Environment <input type="checkbox"/><br/>           Design <input type="checkbox"/><br/>           Doc/Data <input type="checkbox"/><br/>           Equip/Tooling <input type="checkbox"/><br/>           Handling/Pre <input type="checkbox"/><br/>           Material <input type="checkbox"/><br/>           Internal Transport <input type="checkbox"/><br/>           Tribal Knowledge <input type="checkbox"/><br/>           LOA <input type="checkbox"/><br/>           Substation <input type="checkbox"/><br/>           Past Expiry Date <input type="checkbox"/><br/>           Misidentified <input type="checkbox"/> </div> <div>           No Re-verification <input type="checkbox"/><br/>           Operator <input type="checkbox"/><br/>           Offset/Setup <input type="checkbox"/><br/>           Supplier <input type="checkbox"/><br/>           Training <input type="checkbox"/><br/>           Use for Testing <input type="checkbox"/><br/>           Poor Information <input type="checkbox"/><br/>           Rushing <input type="checkbox"/><br/>           Product Improvement <input type="checkbox"/><br/>           Process Improvement <input type="checkbox"/><br/>           Manufacturing Process <input type="checkbox"/><br/>           Past Due <input type="checkbox"/> </div> </div> |  | <b>FAULT CATEGORY</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Pressure/Forced <input type="checkbox"/><br/>           Bending <input type="checkbox"/><br/>           Centre Not Concentric <input type="checkbox"/><br/>           Cracks <input type="checkbox"/><br/>           Crimp/Kink/Ripple/Wave <input type="checkbox"/><br/>           Cuffs <input type="checkbox"/><br/>           Crushing <input type="checkbox"/><br/>           Heat Treat <input type="checkbox"/><br/>           Wave/Twist in Tube <input type="checkbox"/><br/>           Marks/Chatter <input type="checkbox"/> </div> <div>           Temperature/Cure <input type="checkbox"/><br/>           Set-up <input type="checkbox"/><br/>           BOM/Route <input type="checkbox"/><br/>           Broken/Damage/Defect <input type="checkbox"/><br/>           Inspection Incomplete/Unqualified <input type="checkbox"/><br/>           Contamination <input type="checkbox"/><br/>           Countersink <input type="checkbox"/><br/>           Cut Too Short <input type="checkbox"/><br/>           Instructions Incomplete/Unclear <input type="checkbox"/><br/>           Drill Holes <input type="checkbox"/> </div> <div>           Power Loss/Surge <input type="checkbox"/><br/>           Folio/Program <input type="checkbox"/><br/>           Grain <input type="checkbox"/><br/>           Weld <input type="checkbox"/><br/>           Wrong Stock Pulled <input type="checkbox"/><br/>           Out of Sequence <input type="checkbox"/><br/>           Off-set <input type="checkbox"/><br/>           Mislabeled <input type="checkbox"/><br/>           Fit/Function <input type="checkbox"/><br/>           Misaligned/off center <input type="checkbox"/> </div> <div>           Positioned Wrong <input type="checkbox"/><br/>           Outside Dimensions <input type="checkbox"/><br/>           Over/Under tolerance <input type="checkbox"/><br/>           Part Incorrect <input type="checkbox"/><br/>           Part Lost/Missing <input type="checkbox"/><br/>           Part Moved <input type="checkbox"/><br/>           Drawing <input type="checkbox"/><br/>           Finish <input type="checkbox"/><br/>           Misread <input type="checkbox"/><br/>           Turning Sequence <input type="checkbox"/> </div> </div> |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |                                                                                                                                                     |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | OTHER : <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |                                                                                                                                                     |  |

*Tuesday, April 19, 2016 11:10:07 AM*

Page 1

**\*1 444.98\***

**\*D6102-013\***

**Start Date:** 4/22/2016

**Required Date:** 5/5/2016

**Start Qty: 20.00**

**Required Qty: 20.00**

**Comments:** IPP Rev:A New Issue 06-07-03 JLM

| Component Item ID/<br>Item Name            | Replacement<br>Item ID | Mfg/<br>Purchase | Bin<br>Item | Primary<br>Location | Last<br>Location | Route<br>Seq ID | Unit of<br>Measure | Qty on<br>Hand | Qty per Kit | Total<br>Qty   | Qty<br>Issued | Date<br>Issued | Status |
|--------------------------------------------|------------------------|------------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|----------------|---------------|----------------|--------|
| D6102-013P                                 |                        | Purchased        | No          |                     |                  | 110             | Each               | 0.0000         | 1           | 20             |               |                |        |
| <b>*D6102-013P*</b><br>6061-T6 7.0X6.5X2.0 |                        |                  |             |                     |                  |                 |                    |                | **          | 20x Sp 16-05-1 |               |                |        |

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

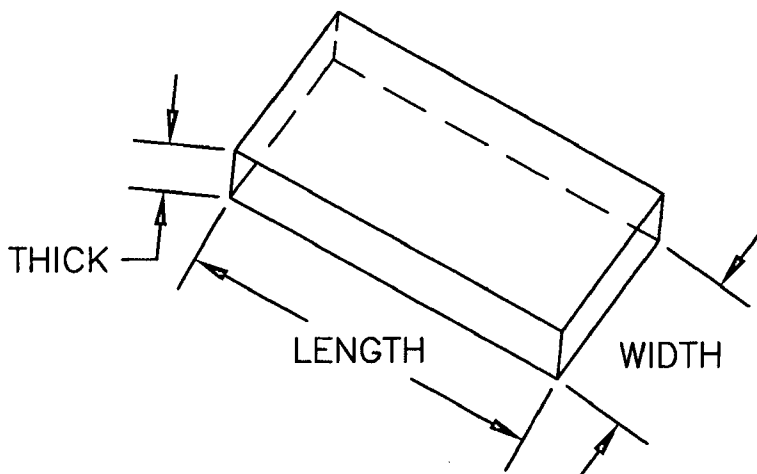
Work Order update only ☐

|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |  |                                              |  |
|--------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--|--|----------------------------------------------|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |                                                | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |                                                            | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div> |                                               |  |  |                                              |  |
| Date :                                                       |                                                | Step #:                                                                                                                                                                            |                                                            | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |  | MRB (QSI042) Approval                        |  |
| Description Work Order Deviation                             |                                                |                                                                                                                                                                                    |                                                            | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                               |  |  | Completed By                                 |  |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |  | Lead hand / Supervisor Approval Verification |  |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |  |                                              |  |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |  |                                              |  |
| Root Cause                                                   |                                                | FAULT CATEGORY                                                                                                                                                                     |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |  |                                              |  |
| Environment <input type="checkbox"/>                         | No Re-verification <input type="checkbox"/>    | Pressure/Forced <input type="checkbox"/>                                                                                                                                           | Temperature/Cure <input type="checkbox"/>                  | Power Loss/Surge <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Positioned Wrong <input type="checkbox"/>     |  |  |                                              |  |
| Design <input type="checkbox"/>                              | Operator <input type="checkbox"/>              | Bending <input type="checkbox"/>                                                                                                                                                   | Set-up <input type="checkbox"/>                            | Folio/Program <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Outside Dimensions <input type="checkbox"/>   |  |  |                                              |  |
| Doc/Data <input type="checkbox"/>                            | Offset/Setup <input type="checkbox"/>          | Centre Not Concentric <input type="checkbox"/>                                                                                                                                     | BOM/Route <input type="checkbox"/>                         | Grain <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Over/Under tolerance <input type="checkbox"/> |  |  |                                              |  |
| Equip/Tooling <input type="checkbox"/>                       | Supplier <input type="checkbox"/>              | Cracks <input type="checkbox"/>                                                                                                                                                    | Broken/Damage/Defect <input type="checkbox"/>              | Weld <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Part Incorrect <input type="checkbox"/>       |  |  |                                              |  |
| Handling/Pre <input type="checkbox"/>                        | Training <input type="checkbox"/>              | Crimp/Kink/Ripple/Wave <input type="checkbox"/>                                                                                                                                    | Inspection Incomplete/Unqualified <input type="checkbox"/> | Wrong Stock Pulled <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Part Lost/Missing <input type="checkbox"/>    |  |  |                                              |  |
| Material <input type="checkbox"/>                            | Use for Testing <input type="checkbox"/>       | Cuffs <input type="checkbox"/>                                                                                                                                                     | Contamination <input type="checkbox"/>                     | Out of Sequence <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Part Moved <input type="checkbox"/>           |  |  |                                              |  |
| Internal Transport <input type="checkbox"/>                  | Poor Information <input type="checkbox"/>      | Crushing <input type="checkbox"/>                                                                                                                                                  | Countersink <input type="checkbox"/>                       | Off-set <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Drawing <input type="checkbox"/>              |  |  |                                              |  |
| Tribal Knowledge <input type="checkbox"/>                    | Rushing <input type="checkbox"/>               | Heat Treat <input type="checkbox"/>                                                                                                                                                | Cut Too Short <input type="checkbox"/>                     | Mislabeled <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Finish <input type="checkbox"/>               |  |  |                                              |  |
| LOA <input type="checkbox"/>                                 | Product Improvement <input type="checkbox"/>   | Wave/Twist in Tube <input type="checkbox"/>                                                                                                                                        | Instructions Incomplete/Unclear <input type="checkbox"/>   | Fit/Function <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Misread <input type="checkbox"/>              |  |  |                                              |  |
| Substation <input type="checkbox"/>                          | Process Improvement <input type="checkbox"/>   | Marks/Chatter <input type="checkbox"/>                                                                                                                                             | Drill Holes <input type="checkbox"/>                       | Misaligned/off center <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Turning Sequence <input type="checkbox"/>     |  |  |                                              |  |
| Past Expiry Date <input type="checkbox"/>                    | Manufacturing Process <input type="checkbox"/> | OTHER : _____                                                                                                                                                                      |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |  |                                              |  |
| Misidentified <input type="checkbox"/>                       | Past Due <input type="checkbox"/>              |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |  |  |                                              |  |



|                  |                |                                                   |                        |
|------------------|----------------|---------------------------------------------------|------------------------|
| DESIGN<br>#      | DRAWN BY<br>PH | DART AEROSPACE LTD<br>HAWKESBURY, ONTARIO, CANADA |                        |
| CHECKED<br>CP    | APPROVED<br>#  | DRAWING NO.<br>D6102                              | Rev. D<br>SHEET 1 OF 1 |
| DATE<br>06.06.30 |                | TITLE<br>SADDLE BILLET, 6061                      | SCALE<br>N.T.S.        |
| A                | 01.03.30       | NEW ISSUE                                         |                        |
| B                | 03.10.20       | ADD D6102-005/-007/-009                           |                        |
| C                | 04.08.25       | ADD D6102-010/-011                                |                        |
| D                | 06.06.30       | ADD D6102-013                                     |                        |

## SPECIFICATION CONTROL DRAWING



SHOP COPY  
 RETURN TO  
 ENGINEERING  
 UNCONTROLLED COPY  
 SUBJECT TO AMENDMENT  
 WITHOUT NOTICE  
 WORK ORDER  
 NO. 14498 MJS  
 16-04-16

**RELEASED**

06.08.15 #

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, LENGTH x WIDTH x THICK (+0.06/-0.00), AND GRAIN DIRECTION AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.06/-0.00.

ALL DIMENSIONS ARE IN INCHES.

| Part No.  | Alloy                                    | Length | Width  | Thick | Grain Direction     |
|-----------|------------------------------------------|--------|--------|-------|---------------------|
| D6102-001 | 6061-T6/T651 (QQ-A-250/11 or QQ-A-200/8) | 7.880  | 6.250  | 2.000 | Along 7.880 Length  |
| D6102-003 | 6061-T6/T651 (QQ-A-250/11 or QQ-A-200/8) | 6.000  | 6.250  | 2.000 | Along 6.000 Length  |
| D6102-005 | 6061-T6/T651 (QQ-A-250/11 or QQ-A-200/8) | 47.85  | 15.250 | 1.000 | Along 47.85 Length  |
| D6102-007 | 6061-T6/T651 (QQ-A-250/11 or QQ-A-200/8) | 7.500  | 7.000  | 2.500 | Along 7.500 Length  |
| D6102-009 | 6061-T6/T651 (QQ-A-250/11 or QQ-A-200/8) | 11.000 | 6.000  | 5.000 | Along 11.000 Length |
| D6102-010 | 6061-T6/T651 (QQ-A-250/11 or QQ-A-200/8) | 7.950  | 8.250  | 2.500 | Along 7.950 Length  |
| D6102-011 | 6061-T6/T651 (QQ-A-250/11 or QQ-A-200/8) | 6.500  | 8.250  | 2.500 | Along 6.500 Length  |
| D6102-013 | 6061-T6/T651 (QQ-A-250/11 or QQ-A-200/8) | 6.500  | 7.000  | 2.000 | Along 6.500 Length  |

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**D6102-013**

**B144498**

**D6102-013**

**B144498**

**D6102-013**

**B144498**

**D6102-013**

**B144498**

**D6102-013**

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**D6102-013**

**B144498**



Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID PO32122

Purchase Order Date 4/21/2016

PO Print Date 4/21/2016

Page Number 1 of 2

Order From :  
METAUX CASTLE  
P.O. BOX 4090 STN A  
TORONTO, ONTARIO M5W OE9  
CANADA

VU-MET002

Ship To : DART AEROSPACE LTD  
1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

E-MAIL

APR 21 2016

Contact Name

Vendor Phone

Ship To Contact

Ship To Phone

Ship Via: Yours ppd

Ship Acct:

Buyer

Customer POID

Customer Tax #

Terms

Currency

FOB

Chantal Lavoie

10127-2607

Net 30

USD

Destination-Collect

| Line Nbr | Reference<br>Vendor Part Number<br>Line Comments<br>Delivery Comments | Description/<br>Mfg ID | Req Date/<br>Taxable<br>Promise Date | CD | Req Qty/<br>Unit of<br>Measure | PO Unit Price | Extended<br>Price |
|----------|-----------------------------------------------------------------------|------------------------|--------------------------------------|----|--------------------------------|---------------|-------------------|
|----------|-----------------------------------------------------------------------|------------------------|--------------------------------------|----|--------------------------------|---------------|-------------------|

|   |            |                             |                             |  |               |         |            |
|---|------------|-----------------------------|-----------------------------|--|---------------|---------|------------|
| 1 | D6101-007P | 7075-T7351<br>8.25X7.75X2.5 | 5/5/2016<br>Yes<br>5/5/2016 |  | 20.00<br>Each | \$56.11 | \$1,122.20 |
|---|------------|-----------------------------|-----------------------------|--|---------------|---------|------------|

AS PER DWG D6101 REV. B  
B144497  
MATERIAL: 7075-T7351 (QQ-A-250/12)  
SIZE: 7.750" X 8.250" X 2.50" THICK  
GRAIN DIRECTION ALONG: 7.750" LENGTH  
TOLERANCE AS PER QUOTE +.030"/-.000"

Line Total: \$1,122.20

|   |            |                     |                             |  |               |         |          |
|---|------------|---------------------|-----------------------------|--|---------------|---------|----------|
| 2 | D6102-013P | 6061-T6 7.0X6.5X2.0 | 5/5/2016<br>Yes<br>5/5/2016 |  | 20.00<br>Each | \$31.65 | \$633.00 |
|---|------------|---------------------|-----------------------------|--|---------------|---------|----------|

AS PER DWG D6102 REV. D  
B144498  
SIZE: 7.000" X 6.500" X 2.00" THICK  
GRAIN DIRECTION ALONG 6.500"  
MATERIAL 6061-T6/T6511 QQ-A-250/11  
TOLERANCE AS PER QUOTE +.030"/-.000"

SP/6-05-11

Note:

4/21/2016

**Castle Metals®**

A. M. Castle &amp; Co.

PACKING SLIP/  
CERTIFICATE OF CONFORMANCE

Page 1 of 2

Shipment No:2968916

|                                                                                                    |                         |                                                                                        |  |                                                                                         |  |                                                                                              |  |
|----------------------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------|--|
| <b>Ship From:</b><br>A. M. CASTLE & CO.<br>2150 ARGENTIA ROAD<br>MISSISSAUGA, ON L5N<br>2K7<br>CAN |                         | <b>Sold To:</b><br>DART AEROSPACE LTD<br>1270 ABERDEEN<br>HAWKESBURY, ON K6A 1K7<br>CA |  | <b>Ship To:</b><br>DART AEROSPACE LTD<br>1270 ABERDEEN<br>HAWKESBURY, ON<br>K6A 1K7 CAN |  | <b>Deliver To:</b><br>DART AEROSPACE LTD<br>1270 ABERDEEN<br>HAWKESBURY, ON<br>K6A 1K7<br>CA |  |
| <b>Date Shipped</b><br>10-MAY-16                                                                   | <b>F.O.B.</b><br>ORIGIN | <b>Freight Terms</b><br>Prepaid                                                        |  | <b>Carrier</b><br>MANITOULIN                                                            |  | <b>BOL No</b><br>2968916-2                                                                   |  |

|                            |                            |                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                |                          |            |             |                              |
|----------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------|-------------|------------------------------|
| Shipment Details           |                            |                                                                                                                                                                                                                                                                                 | Final Destination Branch - TOR                                                                                                                                                                                                                 |                          |            |             |                              |
| Order No<br>4334338        | Line No<br>2               | Item No<br>8641 MO                                                                                                                                                                                                                                                              | Description<br>2.0000.PL.6061.T651.ALUMINUM.48.5000.144.5000.<br>CUT 2SIDED TO 7 IN ( + .0310/- .0000 IN (GRAIN TO RUN ALONG 6.5")) X 6.5 IN ( + .0310/- .0000 IN (GRAIN TO RUN ALONG 6.5")) - ALUMINUM PLATE SAW SPECIFICATIONS: QQ-A-250/11- |                          |            |             |                              |
| Purchase Order No<br>32122 |                            | Part Number<br>YOUR ITEM NUMBER:<br>D6102-013                                                                                                                                                                                                                                   | Ordered Qty<br>20.00 PCS                                                                                                                                                                                                                       | Invoice Qty<br>20.00 PCS |            |             |                              |
| Details                    |                            | ALL PAPERWORK MUST FOLLOW ORDER / CUSTOMER MUST RECEIVE AT TIME OF DELIVERY<br>ALL MATERIAL MUST HAVE IDENTIFYING MARKINGS EX:HEAT #S<br>Email P/s and certs to: clavoie@dartaero.com<br>END USER: DART AEROSPACE<br>END USE: COMMERCIAL AIRCRAFT PARTS<br><div>8016-0511</div> |                                                                                                                                                                                                                                                |                          |            |             |                              |
| Delivery No.<br>120420102  | Mill<br>KAISER<br>ALUMINUM | Heat Number<br>                                                                                                                                                                              | Mech Id                                                                                                                                                                                                                                        | PCS<br>20                | Width (IN) | Length (IN) | Shipped Qty(LBS)<br>182.2848 |

These commodities/technologies are subject to US Export Administration &amp; US State Dept. Regulations and, if intended for export, were/are exported thereunder. Diversion contrary to US Law is Prohibited.

We hereby certify the material covered by this certification conforms in accordance with the above specifications and has been found to meet the applicable requirements for the material, including any specifications forming a part of the description. Test reports are on file subject to examination. All claims for defective material are waived unless made in writing to A.M. Castle &amp; Co. within 60 days of the shipment. Material cut to the correct size, or material cut by the customer cannot be returned.

These commodities, technology or software were exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to US law prohibited.

Date Printed: 10-MAY-2016 05:13:23 PM



**Castle Metals®**

A. M. Castle & Co.

PACKING SLIP/  
CERTIFICATE OF CONFORMANCE

Page 2 of 2

|                                                      |                  |
|------------------------------------------------------|------------------|
| for credit.                                          |                  |
| Reviewed by Authorized Castle Metals Representative: | Date:      Name: |

*Chris Galt*

MAY 10 2016

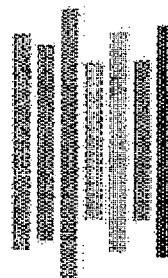


*8016-0511*

Exova  
15 High Ridge Court  
Cambridge  
Ontario  
Canada  
N1R 7L3

T: +1 (519) 621-0191  
F: +1 (519) 621-7700  
E: sales@exova.com  
W: www.exova.com

Exova



## Test Certificate

Castle Metals  
2150 Argentia Road  
Mississauga, Ontario  
L5N 2K7

REF No G651490 Issue 1  
Page 1 of 1  
Ord No 31970  
Date Tested 03/14/16  
Date Reported 03/14/16

Attn: Graham Reid/Chris Colish

Item - Ref: 2.000" PL Aluminum Sample, 6061-T651, Heat #152908B0

Specification - AMS 4027N 2008-07

### Chemical Analysis - See Below

|                                        | Cr [%] | Cu [%] | Fe [%] | Mg [%] | Mn [%] | Ni [%] | Pb [%] | Si [%] | Sn [%] | Ti [%] | V [%] | Comments  |
|----------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-----------|
| 001:                                   | 0.20   | 0.28   | 0.51   | 0.94   | 0.09   | 0.02   | <0.01  | 0.67   | <0.01  | 0.02   | 0.01  | See Below |
|                                        | Zn [%] | Zr [%] |        |        |        |        |        |        |        |        |       | Comments  |
| 001:                                   | 0.12   | <0.01  |        |        |        |        |        |        |        |        |       | See Below |
| Item 001: Other Elements, Each = <0.05 |        |        |        |        |        |        |        |        |        |        |       |           |
| Other Elements, Total = <0.15          |        |        |        |        |        |        |        |        |        |        |       |           |

### Certificate Comments

Tested in accordance with Pratt & Whitney Requirements for EC-17.

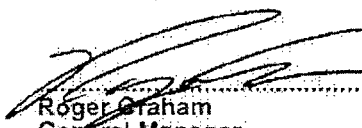
Chemical analysis conducted in accordance with ASTM E1251-11.

Chemical analysis on the sample tested complies with SAE AMS 4027N.



PRAHB

Tested by Exova Burlington

  
Roger Graham  
General Manager  
For and on authority of  
Exova

|                                                                                              |
|----------------------------------------------------------------------------------------------|
| SHIP TO:<br>A M CASTLE & CO<br>3050 SOUTH HYDRAULIC<br>WICHITA, KS 67216                     |
| SOLD TO:<br>AM CASTLE & CO-SOLD TO<br>1420 KENSINGTON RD<br>SUITE 220<br>OAK BROOK, IL 60523 |

**KAISER  
ALUMINUM**  
Trentwood Works - Spokane, WA 99215  
Phone: (800) 367-2586

## CERTIFIED TEST REPORT

Serial Number  
4398002

|                               |                                                      |                                      |                                   |                                             |
|-------------------------------|------------------------------------------------------|--------------------------------------|-----------------------------------|---------------------------------------------|
| CUSTOMER PO NUMBER:<br>340213 | WORK PACKAGE:                                        | CUSTOMER PART NUMBER:<br>8641        | SHIP RUN/LOAD:<br>103394/13       | GOVT CONTRACT NUMBER:                       |
| KAISER ORDER NO:<br>1197080   | LINE ITEM:<br>1                                      | SHIP DATE:<br>21-NOV-2015            | ALLOY:<br>6061                    | CLAD:<br>BARE                               |
| TEMPER:<br>T651               | PRODUCT DESCRIPTION:<br>KaiserSelect Precision Plate |                                      |                                   |                                             |
| WEIGHT SHIPPED:<br>5554 LB    | QUANTITY:<br>4 PCS EST.                              | TRUCK B/L #:<br>2057128              | GROSS<br>20000 IN<br>(508.000 MM) | DIAMETER/WIDTH:<br>48.500 IN<br>(1231.81MM) |
|                               |                                                      | LENGTH:<br>144.500 IN<br>(3670.3 MM) |                                   |                                             |

MHU 1943568: LOT 15290880: 2 pieces;  
MHU 1943571: LOT 15290880: pieces;  
MHU 1946566: LOT 15177584: 1 pieces;

### Certified Specifications

DAS  
14  
9-09

1605114

AMS 4027/RevN  
EN 10204-3.1/Rev2004

ASME SB 209/Rev2010

ASTM B 209/Rev14

Test Code: 1511

### Test Results

Lot: 15177584 Cast 384 Drop 68 Ingot 4 Melted in USA

(ASTM E8/B557)

(EN 2002-1)

| Tensile: | Temper: | Dir / # Tests    | Ultimate KSI (MPA)         | Yield KSI (MPA)            | Elongation % |
|----------|---------|------------------|----------------------------|----------------------------|--------------|
|          | T651    | LT / 2 (Min:Max) | 48.3 : 48.4<br>(333 : 334) | 44.0 : 44.3<br>(303 : 305) | 13.3 : 14.0  |

(ASTM E1251)

| Chemistry:  | SI   | FE  | CU   | MN   | MG  | CR   | ZN   | TI   | V    | ZR   | OTHER    |
|-------------|------|-----|------|------|-----|------|------|------|------|------|----------|
| Actual(Wt%) | 0.77 | 0.6 | 0.32 | 0.07 | 1.0 | 0.23 | 0.15 | 0.02 | 0.01 | 0.00 | TOT 0.06 |

Controlled by CASTLE METALS - Mtl.  
to P & WC - MCL Manual Section FC-17



PRAHB





Trentwood Works - Spokane, WA 99215  
Phone: (800) 367-2586

## CERTIFIED TEST REPORT

Serial Number  
4398002

Lot: 15290880 Cast 384 Drop 29 Ingot 1 Melted in USA

(ASTM B5/B557)  
(EN 2002-1)

|          |        |                  |                            |                            |              |
|----------|--------|------------------|----------------------------|----------------------------|--------------|
| Tensile: | Temper | Dir / # Tests    | Ultimate KSI (MPA)         | Yield KSI (MPA)            | Elongation % |
|          | T651   | LT / 2 (Min:Max) | 48.2 : 46.7<br>(332 : 336) | 42.0 : 42.8<br>(290 : 295) | 15.8 : 16.4  |

(ASTM E1251)

|             |      |     |      |      |     |      |      |      |      |      |          |
|-------------|------|-----|------|------|-----|------|------|------|------|------|----------|
| Chemistry:  | SI   | FE  | CU   | MN   | MG  | CR   | ZN   | TI   | V    | ZR   | OTHER    |
| Actual(wt%) | 0.72 | 0.6 | 0.29 | 0.09 | 1.1 | 0.19 | 0.14 | 0.02 | 0.01 | 0.00 | TOT 0.05 |

### ALLOY LIMITS

|          |      |     |      |      |     |      |      |      |      |      |       |      |
|----------|------|-----|------|------|-----|------|------|------|------|------|-------|------|
|          | SI   | FE  | CU   | MN   | MG  | CR   | ZN   | TI   | V    | ZR   | OTHER | MAX  |
| 6061     |      |     |      |      |     |      |      |      |      |      |       |      |
| MIN(wt%) | 0.40 | 0.0 | 0.15 | 0.00 | 0.8 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | EACH  | 0.05 |
| MAX(wt%) | 0.8  | 0.7 | 0.40 | 0.15 | 1.2 | 0.35 | 0.25 | 0.15 | 0.05 | 0.05 | TOT   | 0.15 |

Aluminum Remainder

ORDER COMMENTS  
AMC A96061-161 R 2  
AMS 4027, ASTM B209

### TEST NOTES

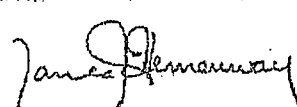
6061 sheet or plate certified to AMS 4025, AMS 4026, or AMS 4027 also meets applicable requirements of cancelled specification AMS-QQ-A-250/11, Rev. A.

### CERTIFICATION

Kaiser Aluminum Fabrication Products, LLC (Kaiser), is ISO 9001:2008/AS9100C certified and hereby certifies that all material shipped under this order:

- has been inspected, tested, and found to be in conformance with the requirements of the specifications indicated herein. For material thicknesses outside specification limits, mechanical properties are as shown herein and chemical composition meets specification requirements.
- was melted in the United States of America or a qualifying country per DFARS 225.672-1(a), was manufactured in the United States of America, and meets the requirements of DFARS 252.225 for domestic content.
- has been thermally processed in compliance with AMS 2773, where applicable.
- is mercury free, within the limits of detection of ASTM E1251 ( $\leq 1$  ppm).
- is in compliance with RoHS 2, European Union Directive 2011/65/EU.
- is in compliance with and regularly monitors any updates to the European Chemical Agency, ECHA, REACH regulations, (EC) n°1907/2006.
- is free of Conflict Minerals, as defined in Section 15.2 of the Dodd-Frank Act.

Any warranty is limited to that shown on Kaiser Aluminum's standard general terms and conditions of sale. Test reports are on file, subject to examination. Test reports shall not be reproduced except in full, without the written approval of the Kaiser Aluminum laboratory. The recording of false, fictitious or fraudulent statements or entries on this certificate may be punished as a felony under federal law.

  
JAMES HEMMENWAY, LABORATORIES SUPERVISOR

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# MATERIAL RECEIPT INSPECTION FORM

PO / BATCH NO 32122/144498

MATERIAL DL102-013  
DATE 16/05/14

MATERIAL CERT REC'D yes  
QUANTITY RECEIVED 20  
QUANTITY INSPECTED 20  
QUANTITY REJECTED \_\_\_\_\_

THICKNESS ORDERED 7.00X6.50X2.00  
THICKNESS RECEIVED 7.00X6.50X2.00  
SHEET SIZE ORDERED \_\_\_\_\_  
SHEET SIZE RECEIVED \_\_\_\_\_

| DESCRIPTION                                        | NCR<br>(Check<br>Y/N)               |                                     | COMMENTS |
|----------------------------------------------------|-------------------------------------|-------------------------------------|----------|
| SURFACE DAMAGE                                     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| CORRECT FINISH                                     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| CORROSION                                          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| CORRECT GRAIN DIRECTION                            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| CORRECT MATERIAL                                   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| CORRECT THICKNESS                                  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| PHOTO REQUIRED                                     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| CORRECT MATERIAL                                   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| CORRECT REF # TO LINK CERT                         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| CORRECT MATERIAL IDENTIFICATION                    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| CORRECT M# ON THE MATERIAL                         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| DOES THIS MATERIAL REQUIRE<br>ENGINEERING SIGN OFF | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| DOES THIS REQUIRE AN<br>EXTRUSION REPORT           | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |

| CUT SAMPLE PIECE OF MATERIAL AND PREFORM A HARDNESS CHECK<br>RECORD RESULTS BELOW |     |     |       |       |
|-----------------------------------------------------------------------------------|-----|-----|-------|-------|
|                                                                                   | HRC | HRB | DUR A | DUR D |
| TYPE OF MATERIAL                                                                  |     |     |       |       |
| SIZE OF TEST SAMPLE                                                               |     |     |       |       |
| HARDNESS / DUROMETER READING                                                      |     |     |       |       |

*testers located in the Quality Office*

| QC 18 INSPECTION     |                   | ENGINEERING SIGNOFF (if required) |  |
|----------------------|-------------------|-----------------------------------|--|
| INSPECTED BY _____   | DAS<br>14<br>9-09 | SIGNED OFF BY _____               |  |
| DATE <u>16/05/14</u> |                   | DATE _____                        |  |

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

# MATERIAL RECEIPT INSPECTION FORM

## INSTRUCTIONS FOR INSPECTING BAR, TUBING, ROUND, & SHEET STOCK

1. VERIFY STOCK TO DART PURCHASE ORDER
2. MEASURE ALL DIMENSIONS FOR EACH PURCHASED STOCK
  - a. WIDTH, THICKNESS, DIAMETER, WALL THICKNESS & LENGTH
3. VERIFY CONDITION OF MATERIAL (e.g. DAMAGED, CORRODED, etc)
4. VERIFY THAT SUPPLIER HAS A NUMBER (HEAT #) ON ITS RECEIVING REPORT TO LINK TO MATERIAL CERTS
5. VERIFY MATERIAL CERTS ARE CORRECT TO THE DART PO INSTRUCTIONS
6. REMOVE / CUT A PIECE OF MATERIAL FOR SAMPLE HARDNESS TESTING

## INSTRUCTIONS FOR INSPECTING SKIDTUBE & STEP EXTRUSION

1. VERIFY TO DART SUPPLIED DRAWING
  2. SAMPLE INSPECT MATERIAL IN BUNDLE TO ENSURE MATERIAL CAN BE RECEIVED INTO DART
  3. USING PORTABLE HARDNESS TESTER VERIFY HARDNESS OF THE MATERIAL TO THE DRAWING
  4. VERIFY THAT MATERIAL CERTS MATCH TO WHAT'S CALLED UP ON THE DART DRAWING
- AFTER MATERIAL PASSES INSPECTION**
5. HAVE DART EMPLOYEES START STOCKING MATERIAL BUT REQUEST MIN 20pcs FOR FULL INSPECTION
  6. INSPECT ALL DIMS AS PER DRAWING REQUIREMENTS

## INSTRUCTIONS FOR INSPECTING CROSS TUBE MATERIAL

1. VERIFY MATERIAL CERTS MATCH THE REQUIREMENTS ON THE DART DRAWINGS
2. INSPECT MIN HALF THE BATCH OF EXTRUSION RECEIVED INTO DART
3. INSPECT MATERIAL AS PER THE EXTRUSION REPORT
  - a. WALL THICKNESS USING ULTRA-SONIC IN 4 LOCATIONS
  - b. OUTSIDE DIAMETER HIGHEST/LOWEST BOTH ENDS
  - c. INSIDE DIAMETER HIGHEST/LOWEST BOTH ENDS
  - d. STRAIGHTNESS @ CENTER OVER 12" SPAN
  - e. WALL THICKNESS USING TUBE MICROMETER HIGHEST/LOWEST BOTH ENDS
4. IDENTIFY EACH TUBE IN SEQUENCE OF INSPECTING (TUBE 1, TUBE 2, ) AND W/O# AND PO#
5. RECORD ALL FINDINGS ON EXTRUSION REPORT

IF ANY QUESTIONS PLEASE SEE OC COORDINATOR BEFORE GOING FURTHER